

CLAIMS

I claim:

1. A pulse controlled phase modulator device comprising:
- a) a continuous wave coherent input signal;
 - b) a pulsed input signal;
 - c) a splitter for receiving said continuous wave coherent input signal, said splitter dividing said continuous wave coherent input signal to produce an independent signal and a dependent signal;
 - d) an independent stage for receiving said independent signal, said independent stage producing a processed independent signal that is not pulse modulated;
 - e) a dependent stage for receiving said pulsed input signal and said dependent signal, said dependent stage pulse modulating said dependent signal to produce a processed dependent signal; and
 - f) a combiner for receiving said processed independent signal and said processed dependent signal, said combiner combining said processed independent signal and said processed dependent signal to produce a continuous wave coherent phase modulated output signal.
2. A device according to claim 1 having an ON operating region and an OFF operating region.
3. A device according to claim 2, where in said ON operating region said processed dependent signal is substantially non-negligible and substantially opposite in phase to said processed independent signal and said pulsed input signal is present.
4. A device according to claim 2, where in said OFF operating region said processed dependent signal is substantially negligible in magnitude and said pulsed input signal is not present.
5. A device according to claim 2, where in said ON operating region said output signal is substantially equal in magnitude and substantially opposite in phase to said output signal in said OFF operating region.
6. A device according to claim 1, wherein said signals are laser beams.
7. A device according to claim 1, wherein said independent stage includes at least one amplifier for increasing the magnitude of said independent signal by a predetermined factor.
8. A device according to claim 7, wherein said amplifier is a semiconductor laser amplifier.

9. A device according to claim 1, wherein said independent stage includes at least one phase inverter for making said processed independent signal substantially opposite in phase to said processed dependent signal.
10. A device according to claim 1, wherein said dependent stage comprises:
- 5 a) an amplifying section for receiving said dependent signal, said amplifying section producing a boosted signal; and
- b) a switching section that receives said boosted signal and said pulsed input signal, said switching section pulse modulating said boosted signal to produce said processed dependent signal that is
- 10 substantially non-negligible and substantially opposite in phase to said processed independent signal in said ON operating region and is substantially negligible in said OFF operating region.
11. A device according to claim 10, wherein said amplifying section includes at least one amplifier for increasing the magnitude of said dependent signal by a predetermined factor.
- 15 12. A device according to claim 11, wherein said at least one amplifier is a semiconductor laser amplifier.
- 20 13. A device according to claim 10, wherein said amplifying section includes at least one phase inverter for making said processed dependent signal substantially opposite in phase to said processed independent signal.
- 25 14. A device according to claim 10, wherein said switching section includes a transmitting switch.
15. A device according to claim 14, wherein said transmitting switch transmits said boosted signal when said pulsed input signal is present and does not transmit said boosted signal when said pulsed input signal is not present.
- 30 16. A device according to claim 14, wherein said transmitting switch partially transmits said boosted signal when said pulsed input signal is present and does not transmit said boosted signal when said pulsed input signal is not present.
17. A device according to claim 14, wherein said transmitting switch is a saturable absorber.
18. A device according to claim 10, wherein said switching section includes at least one phase inverter for making said processed dependent signal substantially opposite in phase to said processed independent signal.

19. A device according to claim 1, wherein said dependent stage comprises:

- a) a switching section that receives said dependent signal and said pulsed input signal, said switching section pulse modulating said dependent signal to produce a switched signal; and
- 5 b) an amplifying section for receiving said switched signal, said amplifying section producing said processed dependent signal that is substantially non-negligible and substantially opposite in phase to said processed independent signal in said ON operating region and is substantially negligible in said OFF operating region.

10 20. A device according to claim 19, wherein said switching section includes a transmitting switch.

21. A device according to claim 20, wherein said transmitting switch transmits said dependent signal when said pulsed input signal is present and does not transmit said dependent signal when said pulsed input signal is not present.

15 22. A device according to claim 20, wherein said transmitting switch partially transmits said dependent signal when said pulsed input signal is present and does not transmit said dependent signal when said pulsed input signal is not present.

23. A device according to claim 20, wherein said transmitting switch is a saturable absorber.

24. A device according to claim 19, wherein said switching section includes at least one phase inverter for making said processed dependent signal substantially opposite in phase to said processed independent signal.

25. A device according to claim 19, wherein said amplifying section comprises:

- a) a boosting segment for receiving said switched signal, said boosting segment providing a boosted signal; and
- 25 b) a filtering segment for receiving said boosted signal, said filtering segment providing said processed dependent signal that is substantially non-negligible and substantially opposite in phase to said processed independent signal in said ON operating region and is substantially negligible in said OFF operating region.

30 26. A device according to claim 25, wherein said boosting segment includes at least one amplifier for increasing the magnitude of said switched signal by a predetermined factor.

27. A device according to claim 26, wherein said at least one amplifier is a semiconductor laser amplifier.

28. A device according to claim 25, wherein said boosting segment includes at least one phase inverter for making said processed dependent signal substantially opposite in phase to said processed independent signal.
 29. A device according to claim 25, wherein said filtering segment includes a threshold device.
 30. A device according to claim 29, wherein said threshold device transmits said boosted signal in said ON operating region when the magnitude of said boosted signal is greater than a predetermined threshold magnitude and when the magnitude of said boosted signal is equal to said predetermined threshold magnitude and does not transmit said boosted signal in said OFF operating region when the magnitude of said boosted signal is less than said predetermined threshold magnitude.
 31. A device according to claim 29, wherein said threshold device partially transmits said boosted signal in said ON operating region when the magnitude of said boosted signal is greater than a predetermined threshold magnitude and when the magnitude of said boosted signal is equal to said predetermined threshold magnitude and does not transmit said boosted signal in said OFF operating region when the magnitude of said boosted signal is less than said predetermined threshold magnitude.
 32. A device according to claim 29, wherein said threshold device is a saturable absorber.
 33. A device according to claim 25, wherein said filtering segment includes at least one phase inverter for making said processed dependent signal substantially opposite in phase to said processed independent signal.